12. MIDI

Objectives

- Define the **MIDI specification** and **GM**
- Discuss the difference between **switched and continuous** MIDI controllers, giving examples.
- Give examples of how MIDI can be used to create **musical expression**

Skills Development

- Numerical skills

Key Words

MIDI
Channel
Polyphony
Controller
Switched
Continuous
Modulation
Expression
Portamento
Glide Time
Quantise
Velocity
Envelope

MIDI Specification

- MIDI was introduced in **August 1983**
- It was a **joint standard** across different manufacturers
- It is a language; it **doesn't store audio data**. Rather it is a **set of commands** sent to connected instruments.
- Each instrument has its own **MIDI channel**. This means that it only responds to its own messages

General MIDI

- General MIDI was a further set of requirements for MIDI devices that was intended to ensure **consistent playback between devices** (particularly with regard to instrument patches)
- GM requires **24-voice polyphony**, standardised **controllers & numbers** and **locations of instruments**
- Whilst MIDI files are very **small**, they are often criticised for sounding **unrealistic**; this is really a criticism of the equipment playing them back rather than the protocol itself.

Commands and Controllers

- MIDI controllers **change a characteristic** of the sound or track
- Controllers are either **switched** or **continuous**; switched controllers either have a value of **0 or 127**, so are **on or off.**
- Continuous controller values range between **0 & 127.**
- You can view controller data in the **MIDI event list** in your DAW, or sometimes in the **piano roll editor.**

Identifying MIDI Controllers

Name	Number	Function	Switched/Continuous
Modulation	1	Adds vibrato (modulates pitch)	Continuous
Volume	7	Changes overall track volume	Continuous
Pan	10	Moves between L, C and R	Switched
Expression	11	Volume fine-tuning	Continuous
Sustain	64	Holds on notes	Switched
Portamento	65	Bends between notes (glide)	Switched
Reverb Depth	91	Adds reverb (amount)	Continuous
Chorus Depth	93	Adds chorus (amount)	Continuous
Reset All	121	Stops all controllers	Switched

Quantise

- Quantise is used to move notes that are poorly timed back onto the beat where they are meant to be.
- It achieves this through ‘snapping’ each note to a grid, the size of which is determined by the **note resolution** you choose
- Resolutions are defined by the number of the the notes you could fit in a bar of 4/4 (e.g. 1/1 – 1 semibreve; 1/2 – two minims etc…)

Quantise

- It has been criticised for removing the musical expression from the music. Thus, some more **advanced quantise functions** were created:
    - Swung quantise
    - Groove templates
    - Iterative quantise
    - Humanise

Articulation and Velocity

- Articulation is how the notes are played; short or long, slurred together or detached.
- This is recreated by altering parameters of the MIDI note, in particular the length and velocity
- You could change the synth's **envelope** to mirror the specific articulation of an instrument
- In Logic, 'Gate Time' can be used to change the feel of the MIDI data

Articulation and Velocity

- When a **note on** command is sent to a MIDI device, it is sent with a specific velocity value (from 0 to 127). This relates to how hard the note is struck

- Velocity is a useful method of us **recreating the sound of real instruments** and avoiding MIDI sequences **becoming mechanical.**

- Synthesisers commonly assign **filter envelopes that are dependent on velocity**